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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,647	10/07/2003	Rene Helbing	10020590-1	5104
7590 12/03/2004			EXAMINER	
AGILENT TECHNOLOGIES, INC. Legal Department, DL429 Intellectual Property Administration P.O. Box 7599 Loveland, CO 80537-0599			JUBA JR, JOHN	
			ART UNIT	PAPER NUMBER
			2872	
DATE MAILED: 12/03/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/680,647

Applicant(s)

HELBING ET AL.

Examiner

John Juba, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-16 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-8 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/7/03.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 6, and 17 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Peng, et al (U.S. Patent Appl. Pub. no. 2004/0008932 A1). Referring *for example* to the discussion of Figures 2B and 3, and relying upon the embodiment employing the polarization diversity scheme (260) shown in the inset, Peng, et al disclose an optical device comprising

an optics system (260) comprising an input (120) to receive optical signals in an incoming direction and an output (121) or (122) to selectively transmit a selected optical signal of said optical signals in an outgoing direction, said optics system being configured to selectively rotate one of the polarization components (e.g., 255a) of each of said optical signals in said incoming direction to a first polarization state;

an optical unit (133a) optically coupled to said optics system, said optical unit being configured to laterally displace and rotate said polarization

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components of said selected optical signal such that the said polarization components of said selected optical signal in said outgoing direction are in said first polarization state [as discussed below]; and

a diffraction grating (130) positioned between said optics system and said optical unit to diffract said polarization components of selected optical signal in said incoming and outgoing direction, said polarization components of said selected optical signal being in said first polarization state in both said incoming and outgoing directions at said diffraction grating.

Although Peng, et al do not expressly say that the polarization components in the outgoing direction are in the first state, or that the polarization components at the grating are in the first state for both passes, the examiner applies the following reasoning. The polarization state leaving "optics system" (260) is, by definition, the first polarization state (\rightarrow). Since there is nothing to change this polarization state prior to incidence at the grating, the polarization state at the grating is the first polarization state. For displacement in the "optical unit" (133a) the polarization state is rotated to (\bar{x}). After reflection in the optical unit, the polarization state is again rotated to (\bar{x}) or (\bar{z}) or *anything in between* (see paras. [0026] – [0028]). Since it is clear that (\bar{x}) and (\bar{z}) are mutually orthogonal polarization states, Peng, et al anticipate that the apparatus is capable of causing the polarization state of light returning to the grating to be *any* polarization state, and thus anticipate that the polarization state will at times be the "first" polarization state, as occasion demands. The illustrated structure is repeated in an arrayed fashion along the direction of dispersion by the grating such that rotation and

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displacement can be performed on a wavelength-by-wavelength basis. It is clear that the rotation is performed on "selected" wavelengths to select the wavelengths that are directed to a given output with a selected attenuation.

With regard to claims 17 – 20, operation of the apparatus of Peng, et al inherently involves performing the recited method steps.

Claims 1 – 3 and 6 – 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kewitsch, et al (U.S. Patent number 6,801,310). Referring *for example* to the discussion of Figures 2 and 3 as modified to include the additional polarization diversity optics of Figure 7, Kewitsch, et al disclose an optical device comprising

an optics system (12) comprising an input (waveguide, "not shown") to receive optical signals in an incoming direction and an output (same waveguide) to selectively transmit a selected optical signal of said optical signals in an outgoing direction, said optics system being configured to selectively rotate one of the polarization components (*via* half-wave plate 15a) of each of said optical signals in said incoming direction to a first polarization state (s');

an optical unit (26)(63)(66) optically coupled to said optics system, said optical unit being configured to laterally displace and rotate (rotate and laterally displace) said polarization components of said selected optical signal such that the said polarization components of said selected optical signal in said outgoing direction are in said first polarization state; and

a diffraction grating (20) positioned between said optics system and said optical unit to diffract said polarization components of selected optical signal in said incoming and outgoing direction, said polarization components of said selected optical signal being in said first polarization state in both said incoming and outgoing directions at said diffraction grating.

A wavelength is "selected" in accordance with the degree of rotation imparted by the liquid crystal cells.

With regard to claim 2, the recited grating pitch is disclosed in Column 9, line 36.

With regard to claims 7 and 8, it is clear that the liquid crystal cells are operated in the electrically controlled birefringence mode (Col. 10, lines 60+).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng, et al (U.S. Patent Appl. Pub. no. 2004/0008932 A1), in view of Kewitsch, et al (U.S. Patent number 6,801,310). As set forth above for claims 1 and 6, Peng, et al disclose the invention substantially as claimed. However, Peng, et al do not disclose the grating line frequency recited in claim 2, and do not disclose the pixels of their polarization modulator as including electrically controllable birefringent material, as

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recited in claims 7 and 8 [Although the liquid crystal of Peng, et al is both electrically controllable and birefringent, in light of the instant disclosure one of ordinary skill would understand the expression “electrically controllable birefringent material” as referring to a material wherein *the birefringence* is electrically controllable.]

In the same field of endeavor, Kewitsch, et al disclose an apparatus for dispersing, weighting, and routing wavelength division multiplexed optical signals carried over an optical fiber. Kewitsch, et al teach that a suitable grating line frequency for dispersing wavelengths used at fiber communications wavelengths should be 1100 – 1200 lines/mm. One of ordinary skill would have understood this as a teaching of a range of grating line frequencies that provides sufficient angular separation of the wavelengths and sufficient spectral resolution.

Barring any unexpectedly improved result arising from the particular selection of grating line frequencies, it appears that in light of the teachings of Kewitsch, et al, one of ordinary skill would have identified a useful range of line frequencies as being at least greater than 900 lines/mm, through only routine experimentation and optimization of the grating for use at fiber communications wavelengths.

With regard to claims 7 and 8, Peng, et al teach that the pixels in their “optical unit” may be liquid crystal (para. [0026]) so as to provide electrically controllable polarization. However, Peng, et al do not particularly disclose the liquid crystal as being operated in an electrically controllable birefringence mode.

In the same field of endeavor, Kewitsch, et al teach that liquid crystals can be operated in the electrically controlled birefringence mode in order to provide variable

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rotation in polarization states and variable retardance useful for effecting the desired attenuation of signals in a similar apparatus.

It would have been obvious to one of ordinary skill to provide the liquid crystal pixels of Peng, et al in a configuration that permits electrically controllable birefringence, since Kewitsch, et al teach that this well-known mode of operation is suited for applications in which signals are to have their polarization states manipulated for weighting and routing in a multiplexed communications apparatus. It is believed that the particular selection of a known technology based upon its known suitability for a particular application does not represent a patentable advance, since the prior art fairly suggests the combination.

Allowable Subject Matter

Claims 9 – 16 are allowable over the prior art. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or fairly suggest

the combination particularly wherein the optical unit comprises a Wollaston prism or polarizing beam splitter and a wave plate positioned such that the polarization components of the selected optical signal in the outgoing direction are *selectively* transmitted through the wave plate, as variously recited in claims 4 and 5; or

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the combination having both an input optical unit and an output optical unit in combination with the intermediate optical unit position between a diffraction grating and an active optical element, particularly wherein the intermediate unit both laterally displaces and rotates the polarization components of the selected optical signal in an outgoing direction, as recited in claim 9.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Brophy, et al (U.S. Patent number 6,275,623) disclose reconfigurable spectral filter comprising an optics system to selectively rotate one of the polarization components of each of the incoming optical signals to a first polarization state, an optical unit to rotate polarization components of *all* of the optical signals such that the components have some fraction in the first polarization state, and a diffraction grating having more than 900 lines/mm. There is no lateral displacement by the optical unit.

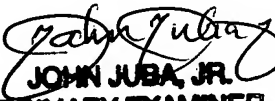
JDS UNIPHASE INC (CA 2,342,719 A1) disclose a method for transmitting selected optical signals comprising selectively rotating polarization components of all of the input signals and diffracting the polarization components.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 - 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.


JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

November 29, 2004